Pole Figures

Hardware Setup

1. The system must be setup with the x-ray tube using the point source.

2. Mount the x-ray lens on the incident beam side. Open the cross slits to 1 x 1 mm.

3. Mount the 0.18 degree collimator on the diffracted beam side. Make sure the collimator slit is not behind the collimator.

User Setup

4. Open the **Organiser** program.

5. Enter your user name and password. (See page 3-3 in the X'Pert Organiser User's Guide to create a new user if you do not have a user name.)

6. Select the **Users & Projects** menu.

7. Select **Select Projects** to select an existing project or **Edit Projects** to create a new project. (See page 3-10 in the X'Pert Organiser User's Guide for more information on creating new projects.)

8. Select **Modules/X'Pert Data Collector** or the Data Collector button on the tool bar to open the Data Collector Program.

9. Select **Instrument/connect** in the Data Collector. The Go On Line box will appear.

10. Select the *Lens + PPC* configuration. Then press the OK button.

Optics Setup

11. Press the *Instrument setting* tab in the tree view. Double click any item in the tree view to prompt another window. Enter 0 in the *2theta* field, 0 in the *offset* field (this will set omega to 0), 0 in the *phi* field, and 0 in the *psi*, x, y, and z fields. Press the OK button to move to these positions.

12. Press the *X-ray* tab. Set the generator power to 45 kV and 40 mA.

13. Select the incident beam optics tab. Double click any item to prompt another window. Select the proper optic components in the new window. Press the OK button.

14. Select the diffracted beam optics tab. Double click any item to prompt another window. Select the proper optic components for the secondary beam side.

Sample Mounting

15. Mount the sample as flat as possible on the stage.

16. Mount the micrometer on the stage and close the enclosure doors.

17. Enter 0 in the psi field and press the Apply button again.

18. Move the z position of the sample stage until the micrometer reads 1.0. (The small inner dial will read 1 and the large outer dial should point to the 0 at the top of the micrometer.) Remove the micrometer and close the doors.

Peak Find

19. If the sample to be analyzed is a multiple phase polycrystalline sample it may be beneficial to do a scan in the area of the angle where the pole figure will be collected. Select **Measure/Manual scan** from the main menu.

20. Select 2theta/omega in the *scan axis* field. In the position fields enter the expected 2theta value for the peak of interest and 0 in the *offset* field. In the scan mode area, enter 10 in the *range* field, 0.04 in the *step size* field, and 0.1 in the *time per step* field. Make sure continuous is selected. Press the start button.

21. Note where any peaks are found, what phases they come from.

22. Close the scan windows.

Measurement Programs

23. Select **File/New Program/Texture measurements** and enter the information in the fields as shown in figures p-1a and b.

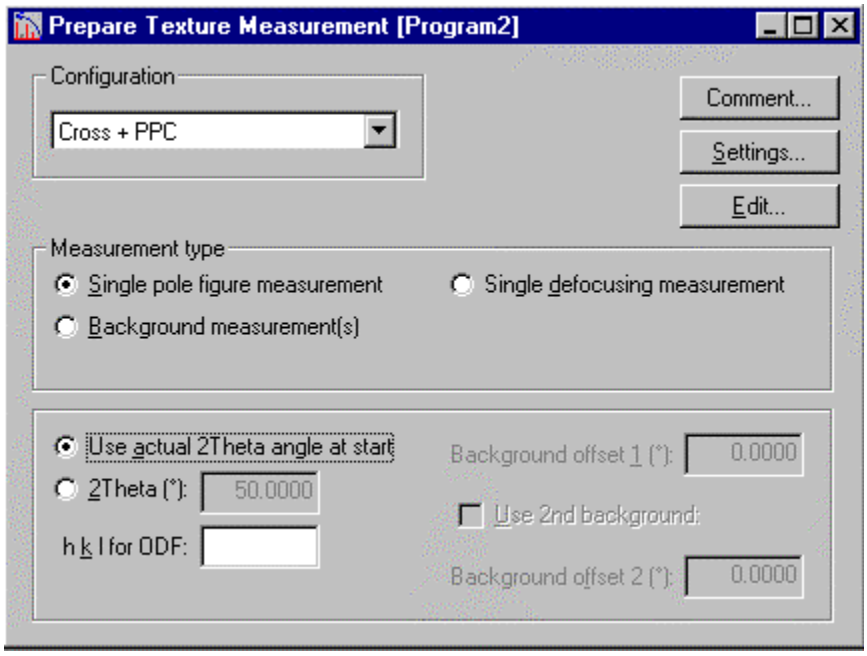

Figure p-1 a

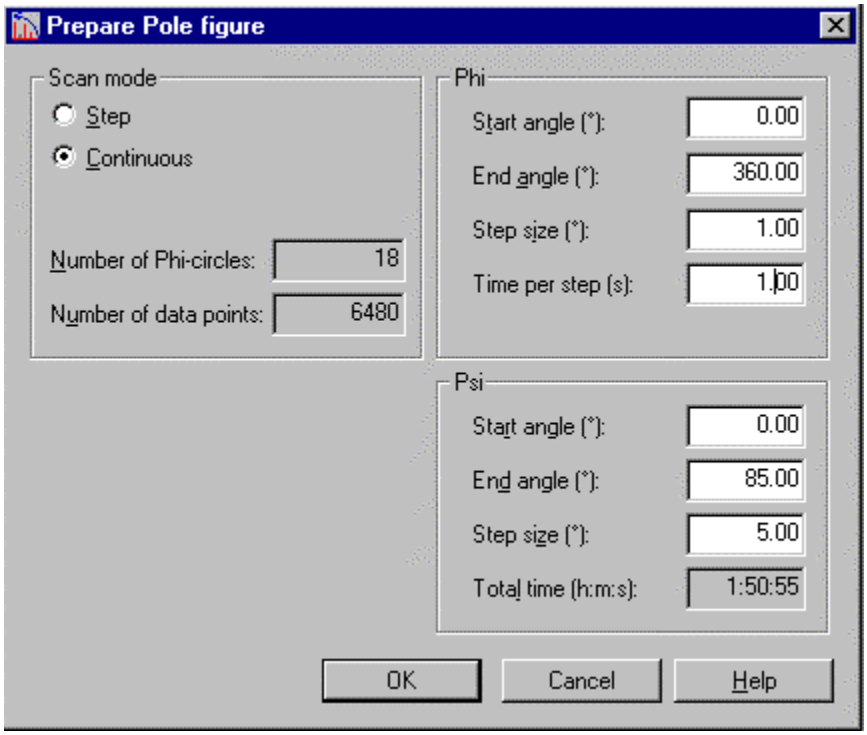

Figure p-1 b

24. Select **File/Save as** and enter a name for the program and then press the OK button.

25. If a background correction is desired for the pole figure continue with step 26. If not skip to step 28.

26. Enter the information in the fields as shown in figures p-2a and b.

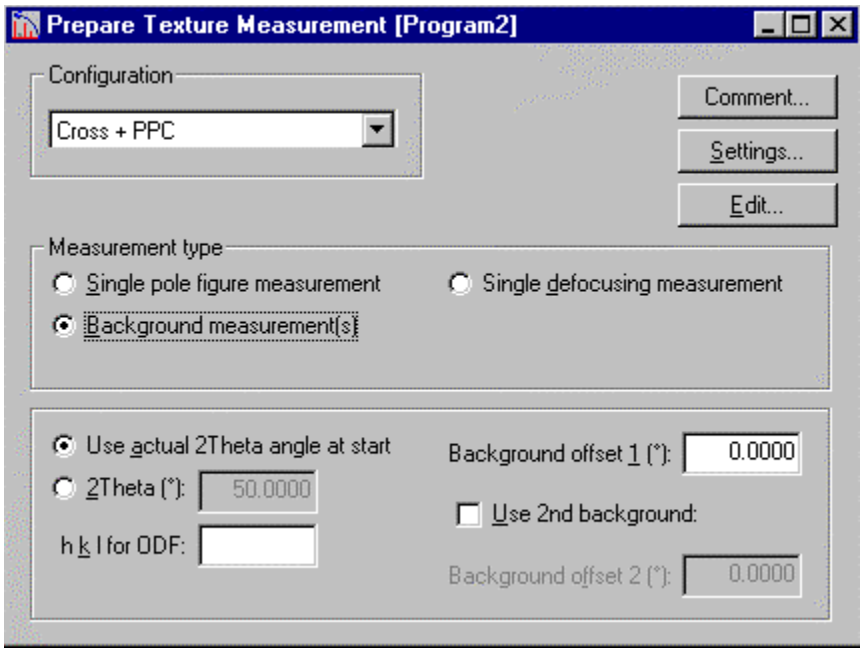

Figure p-2 a

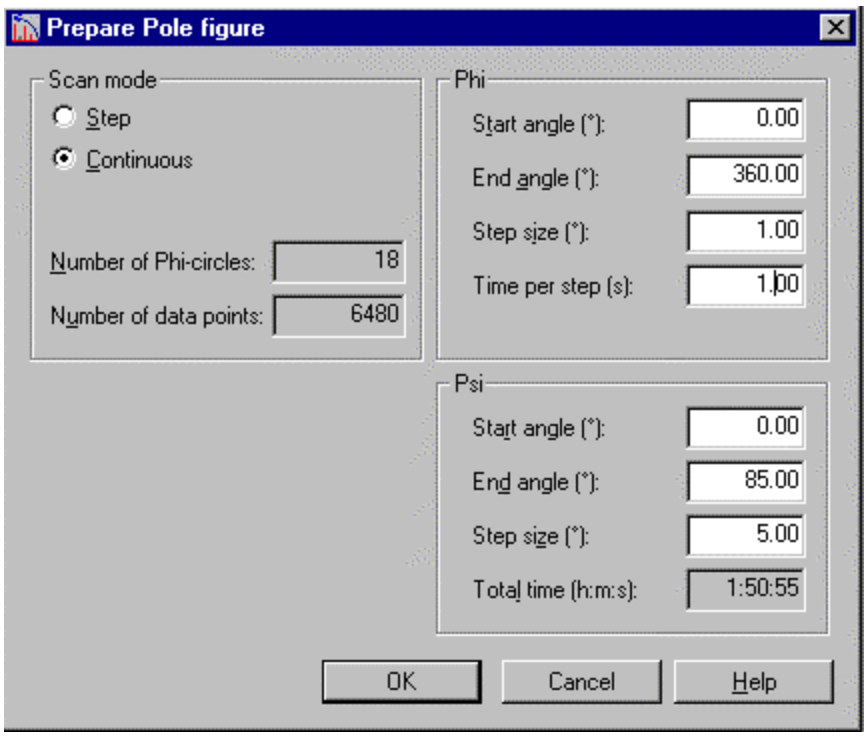

Figure p-2 b

27. Select **File/Save as** and enter a name for the program and then press the OK button.

28. If several pole figures will be collected on the same sample and/or a background correction will be measured continue with step 29 to create a batch program. If just a single pole figure measurement is desired skip to step 32.

29. Select **File/New program/General batch** and enter point in the configuration field.

30. Enter the information as shown in figures p-3a and b.

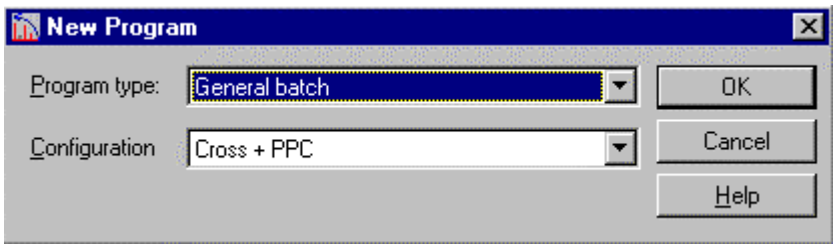

Figure p-3 a

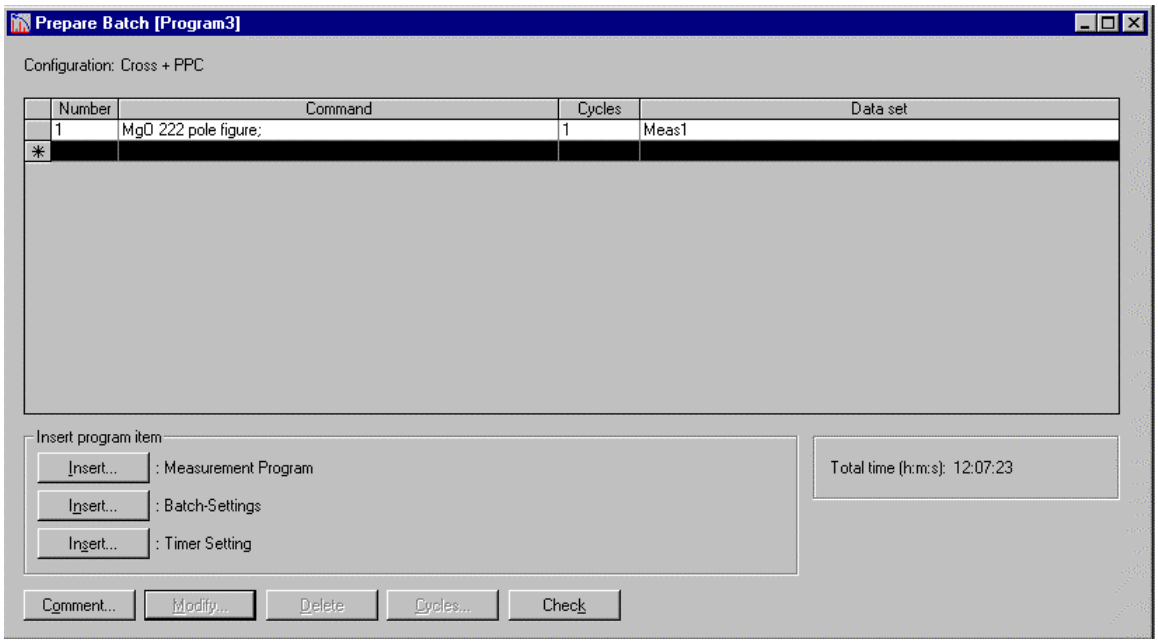

Figure p-3 b

31. Select **File/Save as** and enter a name for the program and then press the OK button.

Measuring

32. Select **Measure/Program/General batch** (or **Texture measurement** for a single measurement).

33. Enter the appropriate program name if it does not already appear. Enter a data file name and a sample identification. If the desired 2theta value for the pole figure has not

been specified in the measurement program enter it in the *2theta* field and enter 0 in the *offset* field.

34. Press the start button.